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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,080	02/13/2006	Renato Caponi	099520018	7439
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FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			EXAMINER DIACOU, ARI M	
			ART UNIT 3663	PAPER NUMBER
			MAIL DATE 09/04/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/568,080

Applicant(s)

CAPONI ET AL.

Examiner

ARI M. DIACOU

Art Unit

3663

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. In the remarks filed 5-19-2008, applicant argued the following:
 - A. On pages 8-10, that that claims 44-48 should not be withdrawn because they do not include the word Raman and are therefore not excluded by the species election requirement.
 - B. On pages 10-16, that the rejection as presented fails to teach various aspects of the claimed invention.

2. Argument A is unconvincing. Excluding bulk and free-space optics, as far as Examiner is aware of, there are only 4 techniques with which to carry out all-optical amplification in a fiber; stimulated Raman scattering (Raman amplifier), stimulated Brillouin scattering, stimulated emission (e.g. EDFA), and electron-hole recombination (e.g. SOA). The application is only concerned with the first and third techniques. Co- and counter-propagating pumping signals applied to both doped fiber amplifiers and Raman amplifiers are known (Raman – Akasaka, Fig. 3, EDFA – Ohishi – [0437]). The election requirement was drawn to whether the 3rd amplifying stage was a Raman or EDF amplifier. Applicant chose to prosecute a Raman amplifier. While theoretically (and in the prior art) both types of amplifiers can be pumped bidirectionally, applicant only discloses bidirectional pumping for an EDFA as the third stage. Therefore, Examiner concluded that claims 46-48 (in addition to 44 and 45 which claim a doped fiber

amplifier) referred to an embodiment with an EDFA, and withdrew them for not reading on the elected embodiment (a Raman amplifier).

3. Argument B is moot in view of the new grounds of rejection, which has been necessitated by amendment.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 31 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 31, the use of "about" renders the claims indefinite because of its use in creating a doubly open-ended range. In the MPEP, section 2173.05(b) specifically states that the use of "about" in claiming a range around a point was held to be definite, while the use of "at least about" was held to be indefinite.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 29-36, 38-43 and 49-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda (USP No. 6172803) in view of Ohishi (USP No. 2002/0080474). Masuda discloses a 3 stage amplifier including a distributed Raman amplifier and two EDFA's [Fig. 18], but fails to disclose either of the EDFA's being of a tellurite network former. Ohishi teaches a two-stage EDFA with an (alumino-) silicate network former as a first stage and a tellurite EDFA as the second stage. [Fig. 31] [Embodiment 41 - page 20]. Therefore, it would have been obvious to one skilled in the

art (e.g. an optical engineer) at the time the invention was made, to replace the silica EDFA's of Masuda with the EDFA stages of embodiment 41 of Ohishi, for the advantage of bandwidth increase provided by the two-stage amplifier of Ohishi.

Together the combination teaches:

- Regarding claim 29, A multi-stage optical amplifier to amplify a transmission signal including a signal wavelength, the multi-stage optical amplifier comprising:
 - a first amplifying stage including a rare-earth doped optical active fiber; [Ohishi: Fig. 31, #205]
 - a second amplifying stage connected to said first amplifying stage, said second amplifying stage comprising a tellurite-based active fiber doped with a rare earth element; and [Ohishi: Fig. 31, #204]
 - a third amplifying stage connected with said second amplifying stage, said third amplifying stage including a silica-based fiber, [Masuda: Fig. 18, #18-4]
 - wherein each of said rare-earth doped optical active fiber [205], said tellurite-based active fiber doped with a rare-earth element [204], and said silica-based fiber is adapted to amplify signal wavelengths in the C-band and in the L-band. [Ohishi discloses a bandwidth of 1525-1610 nm] [Masuda discloses signals from 1540-1610 nm] [While definitions are vague, 1550 nm is always in the C band and 1600 nm is always in the L band]
- Regarding claim 30, Masuda discloses Fig. 18.

- Regarding claims 31 and 32, Ohishi discloses a bandwidth of 1525-1610 nm and Masuda discloses signals from 1540-1610 nm. Ohishi discloses channels in [0021].
- Regarding claim 33, Ohishi discloses [0419].
- Regarding claim 34, there is nothing in the claims to prevent the examiner calling the middle stage of the combination the first stage. Further, Masuda discloses amplifier 14-12 as silica based.
- Regarding claim 35, Ohishi discloses [Fig. 18, #203(b)] and [0424].
- Regarding claims 36, 41 and 42, Ohishi discloses [0437].
- Regarding claims 38 and 39, Ohishi discloses [Fig. 31, #210(b)].
- Regarding claim 40, Ohishi discloses on page 20, embodiment 43, two tellurite EDFA stages.
- Regarding claim 43, Ohishi discloses that one pump can be 1480 nm, but fails to disclose what λ_2 should be, but in [0437] says that stages can be co-, counter-, or bidirectionally pumped, it would be obvious to have the other pump be 1480 nm as well.
- Regarding claims 49 and 50, Masuda discloses [Col. 9, lines 4-8].
- Regarding claims 51-52, Masuda discloses [Fig. 18, #18-6].
- Regarding claim 53, Masuda discloses [Fig. 18, #18-6], 1510 nm is substantially 1500 nm.
- Regarding claim 54, Masuda discloses a GFF between the two EDFA stages [Fig. 18, 14-4]. It would be obvious to put it between any two other stages.

- Regarding claims 55-56, Masuda discloses [Fig. 18, #14-5].

10. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over masuda and Ohishi as applied to claims 29-36, 38-43 and 49-56 above, and further in view of Evans (USP No. 6310716). Ohishi and Massuda disclose the invention with all the limitations of claim 35, but fail to disclose a 980 nm pump for an EDFA. Evans teaches that 980 nm and 1480 nm pumps are obvious choices for EDFA's [Col. 1, line 35]. Therefore, it would have been obvious to one skilled in the art (e.g. a optical engineer) at the time the invention was made, to pump the EDFA of the combination of Masuda and Ohishi at 980 nm, for the advantage of using a known an proven alternative with advantages known in the art.

Conclusion

11. The references made herein are done so for the convenience of the applicant. They are in no way intended to be limiting. The prior art should be considered in its entirety.
12. The prior art which is cited but not relied upon is considered pertinent to applicant's disclosure.
13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ari M. Diacou whose telephone number is (571) 272-5591. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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/AMD/

3-Sep-08

/Jack W. Keith/

Supervisory Patent Examiner, Art Unit 3663